

Classroom Blogging: What is the Role in Science Learning?

ALISON SAWMILLER

Abstract: Educators are encouraged to integrate technology into their classrooms because today's student is exposed to all sorts of digital devices in their daily life. Classroom blogging is an excellent way to use the internet for more than just research. Blogging capitalizes on student interest in the internet. When done properly, a blog can serve as an online portfolio to showcase student work. Blogging can give the "silent student" a voice by allowing them the opportunity to write on topics of interest. Finally, blogging provides immediate, "click-to-publish" results. Student work is available immediately for peers to review or for others on the world wide web to comment and post feedback. All of these factors can be motivating for students to learn.

Keywords: blogging, technology, science education

Scientific literacy, the ability to read and write effectively in science, is central to an effective science curriculum (Baker et al. 2008). There has been a shift in the minds of curriculum developers toward the idea that students do, in fact, need to practice their writing skills in the science classroom to learn science. Writing encourages critical thinking, cognition, and metacognition by requiring students to actively think and process concepts taught in school. Traditionally, writing to learn science has taken the form of journal entries, lab reports, and extended response questions. All of these writing tasks involve pencils and notebook paper. Today, writing in science has ventured into the electronic world as well.

New technologies are changing the way that students view and interact with their world outside of the classroom. When the three o'clock bell rings, students take out their cell phones and text their friends the whole way home. Upon arriving home, they sit down to their computer and log on to Facebook or MySpace to commu-

nicate electronically with peers, both locally and globally. Herein lies the problem. At home, students read and write electronically, using computers, iPods, and Kindles. In the classroom, students read and write almost exclusively on paper. Hull and Schultz (2001) call this technological disconnect "out of school literacies." Students' experiences at home are often at odds with their experiences at school. Rheingold identifies "a basic distinction between education and schooling: people, especially young people, continue to learn—and to adopt new media—but institutions, and those who run them, are much slower to change their ways" (2004). Student interest and familiarity with online communication can and should be incorporated into teaching. Using emerging technologies will allow students' experiences at school and at home to converge. One way to integrate electronic reading and writing into the classroom is with a weblog.

The Role of Blogging in Science Learning

The Basics of the Blog

With writing and technology as keys for student learning in science, specific tools such as the weblog should be fundamental in the classroom. A weblog, or blog, is a personalized website that is a collection of entries. The entries may be commentaries, videos, pictures, or similar to journal entries. Readers can stay updated on new entries by subscribing to the blog. Blogs allow individuals to share writing samples, pictures, and videos with friends, family, and strangers. Other people may leave comments on a blog, allowing for collaboration. Using a blog in the classroom can also increase motivation, challenge critical thinking skills, aid in differentiated instruction, extend the classroom walls, and cash in on student interest in technology.

Blogging has become so popular in today's society that it has its own jargon. A *blog* is the Web site with

Alison Sawmiller is a junior high/high school teacher at Crestview High School, Convoy, OH.

information and links, a *blogger* is one who maintains the blog, the *blogosphere* is the entire networked, inter-linked community of blogs and bloggers, and *blogging* is the act of creating or sustaining a blog! The number of blogs worldwide is estimated at around 70 million, with 120,000 new blogs created every day (Sifry 2007). Blogs come in all shapes and sizes. An educator may create a classroom blog that simply lists homework assignments and links important documents, or he or she may use a blog to produce an online gallery of student work and pictures of the class's undertakings in science. An experienced blogger may publish a weblog with assignments, links to documents, links to video and pictures, journal entries between student and teacher, writing prompts, and newsletters—the possibilities are endless. All of these approaches can be taken to integrate science, writing, and technology, while opening up the gate of online communication.

The Digital Learner and Technology

The twenty-first-century student shows very few similarities to a student of the past. Since birth, today's students have been exposed to technologies in ways never seen before. Prensky (2001) calls these students "digital natives," because they were born into a digital world, rich with computers and digital devices such as digital cameras, cell phones, computers, Kindles, and iPods. Digital natives view technology as a foundation for the classroom, not a tool. However, their knowledge and interest in technology is rarely embraced and used in school. The gap between their at-home and at-school experiences, especially as pertaining to writing, is growing.

According to a NETDAY survey conducted in March 2005, technology has become "an indispensable tool in the education of today's students" (Richardson 2006, 6). Results from this survey indicate that 81 percent of students in grades 7–12 have an e-mail account, 75 percent use at least one instant messenger program, and 97 percent strongly believe that technology use is critical in the classroom. Another survey released by the National School Boards Association and Grunwald Associates, LLC, found that 96 percent of 9- to 17-years olds who have Internet access use social networking technologies such as blogging, texting, chatting, and instant messaging (*Reading Today* 2007). Technology can no longer be an accessory in the classroom; it needs to be the foundation. As technologies change, changes need to be made in the curriculum to enhance student learning.

Technology's role in the classroom can take two different avenues: learning *from* technology and learning *with* technology (Irving 2006). Learning from technology usually takes the form of tutorials or computer drilling practice. This type of learning places more of an emphasis on the computer program that teaches

the student. Learning with technology uses simulations and online tools. An increased weight is placed on the shoulders of the teacher to direct instruction for meaningful lessons. Technology alone will not improve student achievement. If implemented into the classroom in a "pedagogically sound" manner, student achievement can soar (Irving 2006, 16).

Using technology and digital devices in the classroom encourages students to develop skills in reading and writing, both of which are essential to effectively learning science concepts (Poling 2005; Ryan and Walking-Woman 2000). Digital technologies facilitate information organization and the connection of this information to prior knowledge (Bell and Flick 2000), which can assist in conceptual development of scientific concepts (Duschl, Schweingruber, and Shouse 2007).

Technology can capitalize on student interest. One principal believes that curricula need to progress so that they are rooted in technology: "The kids know the technology. What they don't often know is how the technology can change them as students. Just because they understand Facebook doesn't mean they understand how to be a better student of English or history" (Ramaswami 2008, 21). Technology provides students with an opportunity to become active learners and choose what they want to read, write, or research (Furstenberg 1997). There is a sense of empowerment when a student has all of that information available to them at their fingertips. The digital learner is the student of the future. Education cannot lag behind any longer in the digital world.

Write to Learn

Writing is an important part of the inquiry-based science classroom (Baker et al. 2008; Graham, Harris, and MacArthur 2006). Writing allows students to acknowledge their prior beliefs and experiences and also provides an opportunity for students to use critical thinking skills. Developing critical thinking skills, which involve problem solving and self-reflection, is a main objective of education.

The most difficult part of learning is being able to explain what is known. E. M. Forster famously questioned this idea when he said, "How do I know what I think until I see what I say?". Being able to communicate is indispensable for participation in today's society. Critical thinking will not just magically occur if writing assignments are given. Teachers need to coach students and provide them with ample opportunities to practice writing skills to enhance critical thinking (MacKnight 2000). By blogging, students are required to read information, filter through the relevant pieces, restructure the information, organize it, and determine a meaningful way to write about it. All of these activities foster critical thinking.

Audience and Motivation

Motivation drives success. Students who are motivated to write tend to spend more time and effort on the writing process. Spending more time on the writing process helps ensure that reflection and analytical thinking skills are at work. To achieve this drive to write, science teachers need to generate inspiring writing prompts and assignments that are authentic and meaningful. One way to connect to the real world is to have a real-world audience. Deb Marciano, associate professor of education, coordinator of elementary education of Washington College in Chestertown, MD, and creator of the "Book Lovers" Online Gallery, believes that "writing should be for others to read" (Ramaswami 2008, 25). For the most part, students who write in the science classroom know that their teacher will probably be the only one who reads their writing. Writing becomes an act that the student needs to do for a grade. There is little interest in writing if an "A" is the sole motivating factor.

However, if a blog with an immediate worldwide audience is used for writing practice, the motivation level of students and the quality of their writing suddenly skyrockets. Other evidence suggests that the ability to click to publish to the Worldwide Web can be motivating (Bull and Kajder 2003). If a writing sample can be published with the click of a button, students tend to spend more time reflecting on the content choices for their blog. They also take ownership of their piece of literature and spend more time on the editing process, because they will not have an opportunity for a "rough draft" (Richardson 2006). This is self-reflection and critical thinking at its best.

Collaboration

Online tools such as blogs support collaboration among students and teachers. Through processes such as writing a blog, students are able to collaborate on projects and express their personal ideas. A classroom blog "gives students an opportunity to work together on projects" (Molina 2005, 2). A high school biology student wrote the following about the collaboration among classmates during a blogging project:

We all worked together to get through the hoops. Each student contributed to "get the job done." I think the experience was beneficial for everyone. The class interaction skyrocketed because of our blogs. . . . Students get to see what other students have to say, which, I think, is really cool because typically we are only given the opportunity to see things from our own point of view. (Thompson 2008)

Most professions require collaboration of some sort. Affording students the opportunity to enrich these collaboration skills should begin in the classroom. Projects created through a classroom blog depend on the input of all students in a group. Students can use a blog to jour-

nal their thoughts and experiences in a specific project. Each student can contribute entries, and the teacher can follow along, noting the interactions that took place within the group. This approach requires that all students in the group collaborate on the specifics of the information that they want in their group electronic portfolio. Using an electronic portfolio in the form of a blog creates a unique, personal learning space that belongs to the student (Waters 2008). A personalized learning environment not only creates a feeling of ownership in the learning process, but it also promotes the varying learning styles of the student.

Differentiated Instruction

A weblog can also be used to meet different learning styles in the classroom. Students may be better visual, auditory, kinesthetic, social, logical, verbal, or solitary learners. The best lessons are the ones that embrace the most styles of learning. Classroom blogging can be differentiated to meet the needs of all students. "I find it very enjoyable to blog and I can relate to topics easier than I would sitting in a classroom and being lectured to," blogged one high school biology student (Lare 2008). It is for this reason that blogs are so attractive. With a blog, the assignment possibilities are endless. Students can reflect through a journal (solitary), write about evidence of science in their life (logical), create a podcast and upload it to the blog (verbal and auditory), conduct an experiment at home and post the findings to the blog (kinesthetic), or post graphs or pictures of science in the real world (visual). Making the project a group experience can apply the social learning style to a blog. By using a classroom blog, teachers give students an opportunity to explore science in a way that is individually adapted to each student's needs.

Silent Students Have a Voice

In virtually every classroom, at least one student exists who does not have a voice. Most often this student has no desire to speak in class because of the social pressures of adolescence. To this student, asking a question is strictly off-limits, and it is difficult for the teacher to probe for understanding. A blog can give the silent student a voice. In an online journal, this student can speak freely on a topic, ask the teacher questions directly, and communicate with other students by leaving feedback on another's blog. This ownership equals power for the silent student.

Teachers and students are able to interact more freely with a blog because of the removal of self-consciousness. This dynamic provides for better instruction and assessment of all students. Whit Douglas suggests:

The assumption is sometimes made that students who aren't speaking are disengaged, when frequently some

of the most silent students are the most engaged and have great things to contribute to the learning community. Online forums are one way I've seen silent student voices emerge. . . online spaces provide moments where students aren't interrupted and talked over, can really flesh out their ideas. (quoted in English 2007, 59)

Expand the Classroom Walls

One of the key features of a blog is that it expands the walls of the classroom. Teachers can post homework assignments and communicate with students and parents. Assuming that the students have Internet access at home, teachers could ask students to research topics and post to their blog from home. Anywhere that there is Internet access, there is an opportunity for teaching and learning. With the use of technology and a blog, the home can now become an extension of the classroom. Blogging creates a unique means for parents to become involved in their child's learning as well. Parents can access and view their student's blog to witness firsthand what is being taught and what their child is learning about science. Students whose parents are actively involved in their education tend to have higher levels of academic success (Andrews and Pate 2006).

Implementation

Many educators may struggle with the decision to incorporate a blog into the classroom curriculum. Part of the concern may be the teacher's comfort level with technology. A learning curve will surely exist as both student and teacher gain knowledge and confidence in the capabilities of the blog.

Before beginning a classroom blog, it is important to set parameters and expectations, as well as to identify ethical Internet usage practices. Student access to the Internet, whether at school or at home, should be taken into consideration before a classroom blog is ever established. Although the number of students who have Internet access at home is growing, not all students have access.

The second step in implementing a classroom blog is to have school access to blogging Web sites. Many schools block blog sites for safety reasons. Technology administrators can provide access to educational blog sites such as www.bloglines.com and www.edublogger.org. After the particular Web site is accessible, it is critical to recognize the Family Educational Rights and Privacy Act (FERPA) regulations regarding publications of minors, including pictures of students, student work, and identification of students by first or last names. Some students may not even have parental permission to use the Internet at school. Tying up these loose ends will reduce future difficulties with the classroom blog.

Conclusion

Using blogs in the classroom can help teach scientific concepts and can increase student learning through the use of a student's preferred learning style, personal interest, and engagement. Classroom blogging creates more opportunities to write, which, through careful scaffolding, encourages self-reflection and critical thinking. The immediate publication of a blog and the promise of a worldwide audience increases student motivation for writing. The integration of technology into the classroom provides a popular and easily accessible venue for students to share their voice through a blog.

Blogging is the bridge spanning the gap that exists between at-home and school experiences of learning. Technology is brought into the classroom via the weblog, while also providing a more motivating means to increase writing and thus improve student learning in the science classroom.

Blogging can be a constructive tool in a science-learning environment. It promotes critical thinking skills, collaboration, and differentiated instruction by using multiple learning styles. Blogs extend the walls of the classroom, creating a learning environment in any place that has access to the Internet. However, the weblog is so attractive to both students and educators because of the motivation it offers. A worldwide audience makes writing authentic and applicable. Educators cannot bury their heads in the technology-rich sand any longer. Technology such as the weblog is simple to use and encourages students to put their writing skills to work. By integrating the weblog into the classroom and incorporating electronic writing into the classroom experience, students can enhance their understanding of science.

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